DESCRIPTION AMENDMENTS

Rewrite the paragraph beginning on page 6, line 13 to read as follows:

The algorithm for the stat mux in the DSLAM 34 has two portions -- a bit allocation portion and a transrating portion, if necessary. The bit allocation portion looks over a region of consideration for each program stream to be incorporated into the outgoing MTS, the region of consideration including at least one group of pictures (GOP) from each program. The total number of bits for the complete GOPs within the region of consideration are determined and compared with a ~~total available~~ number of <u>available</u> bits for the iteration of the allocation portion for this region of consideration. If the total number of bits for the GOPs is less than or equal to the ~~total available~~ number of <u>available</u> bits, then the GOPs are inserted into the outgoing MTS packets and the transrating portion of the algorithm is bypassed.

Rewrite the paragraph beginning on page 7, line 1 to read as follows:

If the total number of bits is greater than the ~~total~~ <u>number of</u> available bits, then bits are borrowed from a borrowed bit pool. The borrowed bit pool includes non real-time data bits, such as Web data or other Internet data including documents. Bits may also be borrowed from the GOPs included in a next iteration of the next region of consideration. The borrowed bits, which include the non real-time data bits and may include some bits from future GOPs, are added to the ~~total~~ <u>number of</u> available bits and, if the total number of bits for the GOPs is now less than or equal to the modified <u>number of</u> available bits, the GOPs are inserted into the outgoing MTS packets, again bypassing the transrating portion of the algorithm.

Rewrite the paragraph beginning on page 7, line 11 to read as follows:

If however the total number of bits of the GOPs still exceeds the ~~total~~ <u>number of</u> available bits, then a bit allocation function is used to determine how much each GOP needs to be reduced. The simplest allocation function is one where an equal percentage of bits is reduced from each GOP in the region of consideration. However other

2

allocation functions may be used -- a priority may be assigned which limits the minimum bit rate for one program stream, such as for sporting events, and the other program streams are then equally allocated to the remaining available bits.

Rewrite the paragraph beginning on page 7, line 19 to read as follows:

As an example of the allocation portion of the algorithm, for a pipe where 5 Mbps are allocated for video and each GOP of three program streams has a number of bits corresponding to 1.5 Mbps, then the total bit rate for all three GOPs is 4.5 Mbps, and no allocation or borrowing of bits is required. If one program stream has a number of bits corresponding to 2.5 Mbps and the other two have a number of bits corresponding to 1.5 Mbps, then the total bit rate is 5.5 Mbps, which is greater than the bit rate determined by the ~~available~~ number of available bits. However by borrowing the data bits and up to 10% of the bits for the next iteration, the total number of available bits may be increased to a corresponding 5.5 Mbps, which is equal to the total equivalent bit rate required. Finally if the number of bits for the three program streams correspond to 3.0, 1.5, and 1.5, then the 6 Mbps is greater than the 5.5Mbps equivalent available bit rate so further bit reduction is necessary, determined according to the allocation function.

Rewrite the paragraph beginning on page 8, line 9 to read as follows:

The first step of the allocation portion of the algorithm is to calculate the number of ~~bits~~ available bits for each GOP in each outgoing program stream for the outgoing CBR MTS from the DSLAM 34 to the subscriber's location 36. The stream picked initially is the one with the highest priority, or is picked arbitrarily if all streams are of equal priority. By convention the picked stream has an index of "1". If an incoming stream GOP fits, then the GOP is placed in the appropriate outgoing MTS packets. However if the incoming GOP does not fit, then the video is adjusted to make the GOP fit. There is a *borrowed bit pool* by which bits, which could be used for sending non-real time data, are borrowed to accommodate particularly difficult to transrate video sequences.

3

Rewrite the paragraph beginning on page 19, line 6 to read as follows:

Thus the present invention provides rate and delivery time multiplexing for bandwidth optimization within a constant bit rate pipe by first allocating the number of bits for each group of pictures and transrating the pictures in the group of pictures where the total number of bits for the group of pictures within a region of consideration is greater than a total available number of available bits after allowing for bit borrowing. The transrating may occur in the compressed domain where the bit reduction is small, either by zeroing the highest spatial frequency coefficients or by requantization, or in the pixel domain by transcoding where the bit reduction is high.

4